

HISTORIC PROPERTY INVENTORY FORM

IDENTIFICATION SECTION

Field Site No.

190-KW

OAHP No.

Date Recorded

20-Apr-98

Site Name Historic Common

Main Pumphouse

Field Recorder

Jim Sharpe

Owner's Name

U.S. Department of Energy, Richland Operations Office

Address

P.O. Box 550

City/State/Zip Code

Richland, WA 99352

State of Washington, Department of Community Development
Office of Archaeology and Historic Preservation
111 21st Avenue Southwest, Post Office Box 48343
Olympia, Washington 98504-8343 (206)753-4011

Status

☒ Survey/Inventory

☐ National Register

☐ State Register

☐ Determined Eligible

☐ Determined Not Eligible

☐ Other (HABS, HAER, NHL)

☐ Local Designation

Photography

Photography Neg. No.

83195-67CN

(Roll No. & Frame No.)

View of

190-KW Main Pumphouse

Date

9/16/83

Classification

☐ District

☐ Site

☒ Building

☐ Structure

☐ Object

District Status

☒ NR

☐ SR

☐ LR

☐ INV

Contributing

☒

Non-Contributing

District/Thematic Nomination Name

Hanford Site Manhattan Project and Cold War Historic District

Description Section

Materials & Features/Structural Types

Building Type

Industry

Plan

Structural System

No. of Stories

One and a basement

Roof Type

☐ Gable

☒ Flat

☐ Monitor

☐ Gambrel

☐ Shed

☐ Hip

☐ Pyramidal

☐ Other (specify)

Cladding (exterior Wall Surfaces)

☐ Log

☐ Horizontal Wood Siding

Rustic/Drop

☐

Clapboard

☐

☐ Wood Shingle

☐ Board and Batten

☐ Vertical Board

☐ Asbestos/Asphalt

☐ Brick

☐ Stone

☐ Stucco

☐ Terra Cotta

☐ Concrete/Concrete Block

☐ Vinyl/Aluminum Siding

☒ Metal (specify)

Corrugated Transite Siding

Other (specify)

Roof Material

☐ Wood Shingle

☐ Wood Shake

☐ Composition

☐ Slate

☐ Tar/Built-up

☐ Tile

☐ Metal (specify)

☒ Other (specify)

Corrugated cement transite

☐ Not visible

Foundation

☐ Log

☐ Post & Pier

☐ Stone

☐ Brick

☐ Not visible

Concrete

☐ Block

☒ Poured

Other (specify)

Integrity

(Include detailed description in Description of Physical Appearance)

Intact

Slight

Moderate

Extensive

Changes to plan

.....

☒

Changes to windows

.....

☐

Changes to original cladding

.....

☒

Changes to interior

.....

☐

Other (specify)

.....

☐

LOCATION SECTION

Address

Building, 190-KW, 100-K-Area

City/Town/County/Zip Code

Richland/Benton County/99352

Twp 13 Range 26 Section 6 I/4 Section NE 1/4 1/4 Sec NE, NE

Tax No./Parcel No.

Acreage

Quadrangle or map name

Coyote Rapids, Wash. 7.5 min series 1986

UTM References Zone 11 Easting 300940 Northing 5168800

Plat/Block/Lot

Supplemental Map(s)

High Styles/Forms (Check one or more of the following)

☐ Greek Revival

☐ Gothic Revival

☐ Italianate

☐ Second Empire

☐ Romanesque Revival

☐ Stick Style

☐ Queen Anne

☐ Shingle Style

☐ Colonial Revival

☐ Beaux Arts/Neoclassical

☐ Chicago/Commercial Style

☐ American Foursquare

☐ Mission Revival

☐ Spanish Colonial Revival/Mediterranean

☐ Tudor Revival

☐ Craftsman/Arts & Crafts

☐ Bungalow

☐ Prairie Style

☐ Art Deco/Art Moderne

☐ Rustic Style

☐ International Style

☐ Northwest Style

☐ Commercial Vernacular

☐ Residential Vernacular (see below)

☒ Other (specify)

Industrial Vernacular

Vernacular House Types

☐ Gable Front

☐ Gable Front and Wing

☐ Side Gable

☐ Cross Gable

☐ Pyramidal/Hipped

☐ Other (specify)

NARRATIVE SECTION

Study Unit Themes (check one or more of the following)

- ☐ Agriculture
- ☐ Architecture/Landscape Architecture
- ☐ Arts
- ☐ Commerce
- ☐ Communications
- ☐ Community Planning/Development

- ☐ Conservation
- ☐ Education
- ☐ Entertainment/Recreation
- ☐ Ethnic Heritage (specify)
- ☐ Health/Medicine
- ☐ Manufacturing/Industry
- ☐ Military

- ☐ Politics/Government/Law
- ☐ Religion
- ☐ Science & Engineering
- ☐ Social Movements/Organizations
- ☐ Transportation
- ☒ Other (specify) Manhattan Project & Cold War Era
- ☒ **Study Unit Sub-Theme(s)** Reactor Operations, Water Treatment

Statement of Significance

Date of Construction 1952-1955 Architect/Engineer/Builder Kaiser Engineers

- ☒ In the opinion of the surveyor, this property appears to meet the criteria of the National Register of Historic Places.
- ☒ In the opinion of the surveyor, this property is located in a potential historic district (National and/or local).

The 190-KW Process Water Pump House was located on the Hanford Site in the K-Reactor Area near the south shore of the Columbia River. Construction of the KW-Reactor and its associated facilities took place from 1952 until 1955 as part of "Project X". All facilities constructed during this project were designed for minimum damage and quick recovery from enemy attack. The facility housed all the large water pumping units and was designed to provide treated coolant water for the 105-KW Reactor. This was accomplished by drawing water from the clearwells to develop necessary pressure to pump the water through the reactor. Large quantities of cooling water for the reactors were essential to prevent a fuel meltdown and the release of fission products. Water from the facility was also used to support fire and sanitation systems. The 190-KW facility housed water pumps and ventilation equipment and was one of several adjoining structures comprising the water pumping plant, powerhouse, electrical substation, valve pit, and control room. The 190-KW Building was the highest building of the adjoining structures.

The 190-KW Process Water Pump House was 2,000 feet west of the 190-KE Process Water Pump House. The K-Reactor Plants were designed to provide a high degree of reliability of water supplies under a wide range of conditions including military attack. A minimum water flow of 112,000 gallons per minute were required of each facility. The K-Reactor Plants were arranged to allow the transfer of process water, river water, and electrical power between one another. After leaving the reactor, process water was detained for about one hour to determine radioactivity levels. Highly contaminated water was discharged into cribs and less contaminated water flowed into retention basins for a short period of time then on into the Columbia River. Process water flow to the 105-KW Reactor was discontinued in 1970 when the reactor was deactivated. Even though the building no longer supplied treated water to the reactor it remained in service to support the completion of projects.

It is therefore the conclusion of the U.S. Department of Energy that Building 190-KW Main Pump House is eligible for inclusion in the National Register of Historic Places under Criterion A as a contributing property within the Hanford Site Manhattan Project and Cold War Era Historic District.

Description of Physical Appearance

The 190-KW Main Pump House was a single story building with a concrete basement and reinforced concrete floors. The building contained structural steel and corrugated transite walls. The walls contained no windows, all ventilation was supplied by fans. The roof was constructed of corrugated cement transite on steel girders with 2 in. foam glass insulation and asphalt gravel built-up surface. Building dimensions were 182.5 feet long by 142.5 feet wide by 30 feet high; covering a 26,000 square foot area that contained three separate bays.

One bay, 182 feet long by 45 feet wide, was spanned by a 15-ton electric bridge crane and six primary low-lift pumps, service water pumps, and filter backwash pumps. The six pumps were operated in parallel and discharged into six, 24-inch wide reactor coolant headers. Each pump set contained a low-lift mixed-flow unit that drew from the pump well and was connected in a series with a high-lift centrifugal pump. Each pump in the set was equipped with flywheels to allow a decreasing flow of water if loss of power occurred. Each low-lift pump had a 35,000 gallon per minute capacity and was capable of 588 revolutions per minute. The low-lift pumps were single-stage, vertical-turbine units designed to provide suction pressure to the high-lift pumps creating the necessary pressure to pump the water through the reactor. This design made it possible to operate the low-lift pumps separately at low discharge pressures and flow rates. The pumps were connected to 1500 horsepower, 4160 volt motors.

A second bay, 182 feet long by 75 feet wide, contained a 25-ton electric bridge crane and six high-lift pumps. The high-lift pumps had a 35,000 gallon per minute capacity. Each high-lift pump was composed of a pump, flywheel, speed-increaser, and electric motor. Each pump was a horizontal, single-stage centrifugal unit. The flywheel weighed 16 tons. Speed-increasers in the gear box provided an input speed of 595 revolutions per minute and an output of 1696 revolutions per minute.

The third bay, 182 feet long by 20 feet wide, contained the ventilation equipment suspended overhead. There were no offices in the building. Adjoining the 190-KW Building was the 165-KW Building. Material quantities for the 190-KW Building included the following: excavation 18,200cy, backfill 4,550cy, concrete 6,364cy, concrete forms 78,860sf, miscellaneous steel 46.2 tons, Re-steel 416.4 tons, structural steel 294.8 tons, ruffing 16,216sf, siding 12, 292lf, pipe 12,292lf, and copper tubing 5,024lf.

Major Bibliographic References

Photograph Number 83195-67CN
Drawing SK SK-1-25125
AEC-GE. 1964. *Catalog of Hanford Buildings and Facilities 100 Areas*. GEH-26434-100. A Report by the AEC-GE Study Group for the Economic Development of Richland. Richland, Washington.
Hanford Atomic Products Operation. 1963. *Volume 3-Description of the 100-KE and the 100-KW Production Reactor Plants*. HW-74095. Richland, Washington.
General Electric Company. 1952. *Design Scope 100-K Area Water Plant Design*. HW-26414. Richland, Washington.
General Electric Company, 1957. *Completion Report Project CA-512 Volume II 100-K Water Plants*. HW24800-103. Richland, Washington.